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Resilience in the Face of Maternal Psychopathology and Adverse Life Events

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Maternal psychopathology has long been recognized as a risk factor for psychopathology in offspring; however, some resilient youth achieve a favorable outcome in the presence of maternal psychopathology. We identified factors that predicted resilience among youth who were exposed to adverse life events, and also examined whether the same factors protected youth against maternal psychopathology and adverse life events. Main and interaction effects of child and family factors were examined employing cross-sectional data from a household probability sample of 1285 youth aged 9 through 17 collected at four sites. On average, children exhibited a greater degree of resilience when they had higher IQ, closer parental monitoring, better family functioning, higher educational aspiration, and were female. Interaction between maternal psychopathology and IQ was significant, and there was a trend between maternal psychopathology and

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gender. A higher IQ is a protective factor against both maternal psychopathology and adverse life events; whereas being a girl seems to be a protective factor against maternal psychopathology, but not adverse life events.

KEY WORDS: resilience; maternal psychopathology; adverse life events; protective factor; risk factor.

A relationship between specific forms of psychopathology in mothers and similar disorders in their offspring has been recognized for many years. Studies have shown this relationship in schizophrenia (Garver, 1997; Kendler, Gruenberg, & Tsuang, 1985), affective disorders (Beardslee, Keller, Lavori, Staley, & Sacks, 1993; Hammen, 1991; Weissman, Warner, Wickramaratne, Moreau, & Olfson, 1997), anxiety disorders (Beidel & Turner, 1997), and alcoholism (Beardslee, Son, & Vaillant, 1986). Although paternal psychopathology maybe equally consequential, the current study focused exclusively on the relationship between mothers with psychopathology and their offspring.

The relationship between maternal psychopathology and psychopathology in the offspring is by no means disorder specific. Children of depressed mothers exhibit higher rates of substance use, anxiety disorders and conduct disorder (Beardslee et al., 1993; Fendrich, Warner, & Weissman, 1990). Children of mothers with social phobia exhibit a higher rate of overanxious disorder, separation anxiety disorder, and major depression (Mancini et al., 1996). Children of schizophrenic mothers are at high-risk for borderline syndrome and severe personality disorders (Tienari et al., 1994), aggressivity and social incompetence (Weintraub & Neale, 1984), or neurobehavioral dysfunction in perceptual-cognitive and motoric areas (Marcus, Hans, Auerbach, & Auerbach, 1993).

Youth psychopathology has also been linked generically to other adverse conditions. Low socioeconomic status (SES) has been associated with poor adaptation, behavioral or emotional problems, or psychiatric disorders (Loeber & Stouthamer-Loeber, 1986; Velez, Johnson, & Cohen, 1989). When exposed to adverse life events, children and adolescents have shown emotional or behavioral problems (Compas, 1989; Tiet et al., 2001), or problems in adaptation (Goodyer, 1990; Rutter, 1990). Because the degree to which children are at risk is generally a function of multiple risk factors, it is crucial to assess the contribution of each of these variables (e.g., paternal psychopathology, lower SES, and adverse life events) when examining the relationship between maternal psychopathology and psychopathology in the offspring.

Notwithstanding the relationship between maternal psychopathology and psychopathology in the offspring, not all children who are exposed to risk, including maternal psychopathology, have psychiatric disorder or maladjustment. This observation has prompted the study of resilience. A cross-tabulation of level of risk and outcome leads to four possible combinations (Tiet & Huizinga, in

press). Study of resilience focuses on the subgroup of youth that are at high-risk for psychopathology or maladjustment but somehow manage to adjust well. Generally, risk research has focused on the differentiation between the group of youth who have low level of risk and favorable outcome versus the group of youth who have high levels of risk and unfavorable outcome. Conversely, research on resilience focuses on the differentiation between (a) the resilient youth, i.e., those with high-risk and favorable outcome versus (b) the high-risk youth who have unfavorable outcome (Tiet & Huizinga, in press).

An important advancement in the study of resilience has been the distinction made between resource factors and protective factors. A protective factor has a buffering effect at high risk but has no or less effect at low risk (interaction effect), whereas a resource factor has a beneficial effect at both low and high risk (main effect) (Garmezy, 1985; Masten et al., 1988; Rutter, 1987). A resource factor is the opposite of a risk factor, which also has a main effect on outcome; a protective factor is the opposite of a vulnerability factor, which has little or no effect at low risk, but magnifies a detrimental effect at high risk (Garmezy, 1985; Luthar, 1991; Rutter, 1987; Tiet et al., 1998). In this study, the identification of main and interaction effects is used as the basis to classify the predictors as resource, protective, risk, or vulnerability factors.

A number of studies have examined resilience in the offspring of parents with affective disorders (e.g., Bearslee & Podorefsky, 1988; Conrad & Hammen, 1993; Radke-Yarrow & Brown, 1993), but there are a few weaknesses in these studies. Some studies used clinical rather than epidemiological samples, and most studies relied on relatively small samples; therefore, the findings may be unstable. Because of small sample sizes, potential confounding factors were not tested. Furthermore, some studies did not have a measure of youth diagnosis but relied exclusively on symptom rating scales.

Conrad and Hammen (1993) found that a positive self-concept, academic success, social competence, a positive perception of the mother, maternal social competence, and having a psychologically healthy father in the home were resource factors associated with lower levels of psychopathology among children of parents with depression ($n = 22$) or bipolar disorder ($n = 18$). Among children of parents with affective disorders, based on a sample of 18 resilient children, 26 troubled children and 19 controls, Radke-Yarrow and Brown (1993) found that resilient youth as a group had a higher IQ, higher academic achievement, a positive self-perception, and a history of good peer relationships; resilient youth elicited more positive reactions from teachers, were less shy, and were more likely to be the favored child in the family. In a longitudinal study of 13- to 19-year-old children of affective-disordered parents, Beardslee and Podorefsky (1988) found that considerable self-understanding, a deep commitment to relationships, the ability to think and act separately from their parents, and fulfilling the role of a caretaker of their parents characterized the resilient youth ($n = 18$).

Fewer studies have examined resilience in offspring of mothers with other types of psychopathology, such as schizophrenia (Anthony, 1987), or substance abuse (Luthar, Merikangas, & Rounsaville, 1993). Given that the association between parental psychopathology and psychopathology in the offspring is not disorder specific, research examining resilience in the offspring of parents with psychopathology, regardless of the specific disorder, is also essential.

One study to date has compared several clearly defined risk groups (i.e., children of mothers with medical illness, unipolar depressive disorder, and bipolar disorder) to explore the generalizability of protective factors across risk groups (Conrad & Hammen, 1993). The study found that children's friendships were protective for children of medically ill mothers, but were not protective for children of mothers with depressive or bipolar disorders. However, it is unclear if this difference was statistically significant, or this was merely an insignificant finding, because no statistical analysis was conducted to examine this difference (Conrad & Hammen, 1993).

Some studies have examined resilience in the face of other types of risk, such as adverse life events. Empirical studies of resilience in the face of adverse life events have identified a number of protective factors, including higher IQ (Garmezy, Masten, & Tellegen, 1984; Tiet et al., 1998), female gender (Masten et al., 1988; Rutter, 1990), higher SES (Masten, et al., 1988), quality of parenting (Masten et al., 1988), and connection to other competent adults (Garmezy et al., 1984). Other variables have been identified as resource factors among children and adolescents, such as family support (Wills, Vaccaro, & McNamara, 1992), and family cohesion (Weist, Freedman, Paskewitz, Proescher, & Flaherty, 1995).

Protective factors have been categorized into three broad sets of variables (Garmezy, 1985; Masten & Garmezy, 1985): (1) characteristics of the child, such as self-esteem or IQ, (2) family characteristics, such as family structure or family functioning, and (3) the availability of external support systems that encourage and reinforce a child's coping efforts, such as other adults outside the immediate family. Rutter (1990) proposed a number of mechanisms by which protective factors have an impact on mental health of children and adolescents. A crucial mechanism is the reduction of the impact of the risk factor on the individual. One way this can happen is by the mental models that are developed to account for these experiences, which are partially the function of intellectual ability. For example, it is suggested that people can recover from even very bad experiences when they can both accept the reality of what has happened and integrate the experiences into their mental schemata (Rutter, 1990). Another mechanism is the alteration in exposure to the risk. For example, children reared by seriously mentally ill parents may cope effectively by developing their social ties with other family members or with people outside the family. One of the most studied mechanisms is the role of one's concepts and feelings about themselves, which have been labeled "self-esteem," "self concept," or other related terms (Rutter, 1990). Rutter (1990) suggested two main types of experiences that are most influential in developing and

maintaining self-esteem: secure and harmonious love relationships, and success in accomplishing tasks that are identified by the individual as central to her or his interests (e.g., academic achievement).

In summary, there are weaknesses in previous research on resilience in the face of maternal psychopathology. First, most studies have relied on rather small samples. Second, few studies of resilience have simultaneously controlled for multiple factors that are known risks of psychopathology in children and adolescents (e.g., paternal psychopathology, adverse life events). Similarly, few studies in this area have examined a large number of child or family factors simultaneously; therefore, confounds between many of these factors could not be examined. Third, few studies exploring protective factors against maternal psychopathology have examined interaction effects (Conrad & Hammen, 1993; Pellegrini et al., 1986). Finally, only one study examined the generalizability of protective factors across defined risk groups (Conrad & Hammen, 1993), but without employing a statistical test. Accordingly, the current study contributes to each of these four areas. Namely, based on a large epidemiological sample, this study examined resource and protective factors in the face of maternal psychopathology, while multiple factors that are known risks of psychopathology in children and adolescents were statistically controlled. A number of factors that are related to the characteristics of the child (IQ, gender, physical health, and educational aspiration), characteristics of the family (family structure, parental monitoring, and SES), and the availability of external support systems (the number of other adults in the household besides the parents) were examined. Furthermore, the effects of these protective factors were examined across two risk factors: maternal psychopathology and adverse life events.

METHOD

Sample

Data were obtained from the NIMH Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study, a collaborative study conducted to develop methods for surveys of mental disorder and service utilization in population samples of children and adolescents. The sample was obtained at four geographic sites in Connecticut, Georgia, New York, and Puerto Rico. Probability samples of children and adolescents ages 9 through 17 residing in each geographic area were selected. A total of 7,527 households across the four sites were enumerated, and 1,523 of the households contained at least one eligible youth. From these, 1,285 dyads of youth and their caretakers were interviewed (84.4%), and each year of age contributed to 10–12% of the total sample at every site. Forty-seven percent of the MECA sample is female. Fifty-one percent is non-Hispanic white, 28% Latino, 15% African American, and 6% other. Approximately 90% ($N = 1,161$) of the adult informants are biological mothers. Where no biological mother was

available, another caretaker was substituted, including biological father ($N = 36$), adoptive/step/foster parent ($N = 47$), grandparent (27), other relative ($N = 9$), or adult sibling ($N = 5$). Details of study design and sampling procedure appeared in Lahey et al. (1996) and Goodman et al. (1998).

Measures

Dependent Variables

Two domains were used to classify youth adjustment: psychiatric disorders and functional impairment. Psychiatric disorder was assessed through the NIMH Diagnostic Interview Schedule for Children Version 2.3 (DISC-2.3) (Shaffer, Fisher, Dulcan, & Davies, 1996) based on DSM-III-R criteria, administered to both the child and parent. Based on the work of Bird, Gould, and Staghezza (1992) and Piacentini, Cohen, and Cohen (1992), a diagnostic criterion was considered positive if reported as present by *either* the parent *or* the child. In other words, the so-called "combined" or "and/or" rule was used at the diagnostic symptom level. A symptom was considered absent only if there were negative responses from both informants. For a detailed discussion of the DISC-2.3 (see Shaffer et al., 1996). Thirty psychiatric disorders were included (major depression; dysthymia; mania; hypomania; attention deficit/hyperactivity disorder, oppositional defiant; conduct disorder; agoraphobia; overanxious disorder; obsessive compulsive disorder; avoidant disorder; panic disorder; separation anxiety; social phobia; generalized anxiety disorder; alcohol abuse/dependence; marijuana abuse/dependence; other substance abuse/dependence; anorexia; bulimia; encopresis; diurnal enuresis; nocturnal enuresis; chronic motor tic; Tourette's disorder; transient tics disorder; and chronic vocal tic).

The Child Global Assessment Scale (CGAS) (Shaffer et al., 1983) of the interviewer, based on parent interview, was used as a measure of functional impairment. The interviewer ratings based on parent interviews correspond more closely to ratings provided by clinicians than do ratings based on youth interviews or those provided by the parents themselves (Bird et al., 1996).

Good adjustment was operationalized as the absence of any psychiatric diagnosis *and* a score above 70 on the CGAS ($N = 697$; 54.24 %). Children who had either a diagnosis *or* a score of 70 or below on the CGAS, or both, were classified as having poor adjustment ($N = 588$; 45.75 %).

Maternal Psychopathology

Maternal psychopathology was measured with the Family History Screen for Epidemiologic Studies (FHE; Lish, Weissman, Adams, Hoven, & Bird, 1995),

based on the adult informant's report on the mother's life-time psychopathology. The conditions assessed in this analysis (number of interview questions per psychiatric condition are shown in parentheses) included: depression/dysthymia (3), mania/hypomania (2), panic attack/limited symptom attack (2), psychosis (2), obsessive-compulsive disorder (2), generalized anxiety disorder/overanxious disorder (1), agoraphobia (1), social phobia (1), alcohol abuse/dependence (1), substance abuse/dependence (1), suicide attempt (1), and antisocial behavior/conduct disorder (1).

Originally intended to be a screen of lifetime history of psychiatric disorders in the informant, and for identification of the biological relatives to be assessed (pedigree collection) (Lish et al., 1995), mothers are considered to have screened positive for a condition on the FHE if the informant answered affirmatively to any of the questions for that condition. In this study, on the other hand, the measure is intended to be a proxy for the diagnoses. We therefore depart from the original algorithms (Lish, et al., 1995) for a few psychiatric conditions, and make the algorithm more restrictive to provide a closer approximation to a DSM diagnosis (American Psychiatric Association, 1994). For instance, the original algorithm (Lish et al., 1995) indicates depressive symptoms with the presence of any one of three items: feeling sad, no energy, or sleep problems; we require the presence of at least two symptoms for the depressive condition. Because not every diagnosis is screened for, five generic items that are not specifically related to any single condition (e.g., staying in a hospital overnight for a psychological problem, or being given medication for psychological problems) were also counted in ascertaining the presence of any psychopathology. (These are the first five items that appear in Table I in the Results section). Consequently, mothers are considered positive if the informants endorsed (a) any of the 5 broader items, (b) any of the 13 items related to specific psychiatric conditions, (c) at least two of the three items measuring depressive symptoms, or (d) both items measuring panic symptoms. Youth are classified as high-risk if their mothers screened positive on any of the criteria as outlined above (28.56%, $N = 367$).

The FHE appears to be an adequate research instrument for measuring maternal psychopathology. Lifetime prevalence of psychopathology based on this brief screening instrument is remarkably similar to the rates of disorder reported by other studies in the United States (e.g., Robins, et al., 1984) and Puerto Rico (Canino et al., 1987). In addition, it has strong predictive value of youth psychopathology and functioning (as shown in the Results section).

Predictors

Four dichotomous variables and seven continuous variables were examined. The dichotomous variables were: (1) youth gender; (2) paternal psychopathology, based on the informant's report on the father's life-time psychopathology on the

FHE (Lish et al., 1995); (3) adverse life events, based on 25 adverse events reported by the youth and dichotomized at the median (≤ 1 versus ≥ 2) (Tiet et al., 1998); and (4) family structure, dichotomized between children living with two biological parents and those in any other family structure, including step, foster, adoptive or single parents.

The seven scaled predictors were: (1) SES, measured by Hollingshead's two factor index of social position (Hollingshead, 1971; Hollingshead & Redlich, 1958); (2) family functioning, based on 5 items reported by the caretakers on their satisfaction with the family environment and communication patterns of the family (Smilkstein, 1978; Good, Smilkstein, Good, Shaffer, & Arons, 1979); (3) parental monitoring, based on 13 items reported by the caretakers on a scale derived from instruments by Dishion and colleagues (Dishion, Patterson, Stoolmiller, & Skinner, 1991), Kandel (1990), and Cohen and Brook (1987); (4) the number of other adults living in the family excluding the biological, step, foster, or adoptive parents; (5) physical health, based on the caretaker's rating of the child's health, ranging from "excellent" to "very poor"; (6) educational aspiration, as reported by youth, ranging from "less than high school graduate" to "graduate or professional school"; and (7) receptive verbal IQ, measured by the Peabody picture vocabulary test-revised (PPVT-R) (Dunn & Dunn, 1981) and standardized for use in all analyses.

Statistical Analysis

First, a multiple logistic regression was conducted to test the unique contribution of maternal psychopathology as well as the main effects of each of the predictors. Second, interaction effects between each of the 11 predictors and maternal psychopathology were examined, while all other factors were controlled. Third, the sample was divided into two subsamples depending on whether the mothers had screened positive or negative on the measure of maternal psychopathology (high risk and low risk). Separate multiple logistic regressions were conducted on each of these two subsamples. All predictors were included in each of the two multiple logistic regressions to separately examine their effects in the absence and presence of maternal psychopathology.

Generalizability of the protective factors was assessed to determine whether these factors have the same protective effects on youth who were exposed to a different risk factor: adverse life events. This factor was chosen because Tiet et al. (1998) have examined the protective factors against adverse life events in the same data set. First, interactions between adverse life events and the predictors were reported, as previously conducted by Tiet et al. (1998). Then, to compare the protective effects across maternal psychopathology and adverse life events, pairs of multiple logistic regression models were compared (Judd & McClelland,

1989) (see equations below). A full model and a compact model were compared. The *full model* consists of (a) one regression coefficient for the interaction between maternal psychopathology and X_i(one of the predictors being tested), and (b) another regression coefficient for the interaction between adverse life events and X_i. This full model assumed that the regression coefficients for these two interactions differed, and therefore were represented by two separate regression coefficients. The *compact model* assumed that these two regression coefficients were the same, and therefore were combined mathematically and represented by a single regression coefficient. Thus, the compact model used up one degree of freedom less than the full model. After estimating the two models, the chi-squares between the two models were compared, for a one degree-of-freedom difference. If the compact model did not significantly differ from the full model, it would be concluded that the effect of the protective factor, X_i, did not differ across the two risk factors (maternal psychopathology and adverse life events). On the other hand, if the compact model was significantly different from the full model, it would be concluded that the effects of the protective factor, X_i, differed across the two risk factors. The main effects of all other predictors were controlled for in all models.

Equations of the *Full Model* and *Compact Model*

Full model:

$$y = b_0 + b_1 X_i + b_2\text{MP} + b_3\text{ALE} + b_4(\text{MP})(\text{ALE}) + \mathbf{b_5}(\boldsymbol{X_i})(\mathbf{MP}) + \mathbf{b_6}(\boldsymbol{X_i})(\mathbf{ALE}) + \ldots \text{ covariates}$$

Compact model:

$$y = b_0 + b_1 X_i + b_2\text{MP} + b_3\text{ALE} + b_4(\text{MP})(\text{ALE}) + \boldsymbol{b_{5'}}[(\boldsymbol{X_i})(\mathbf{MP}) + (\boldsymbol{X_i})(\mathbf{ALE})] + \ldots \text{ covariates}$$

Note: X_i = each of the predictors; MP = maternal psychopathology; ALE = adverse life events

RESULTS

Table I shows frequencies and percentages of lifetime psychological symptoms of the mothers. About twenty-nine percent ($N = 367$) of the mothers in these four community samples were reported to have some lifetime psychiatric problems. The most common factors elicited are depressive symptoms (12.1%), medication for psychological problems (8.6%), and serious mental illness (5.8%).

Table I. Frequencies of Lifetime Maternal Psychological Symptoms Measured by the Family History Screen for Epidemiologic Studies (FHE) ($N = 1285$)

FHE items	Frequency	Percentage
Had serious mental illness	74	5.8
Stayed overnight in a hospital for mental problem	33	2.6
Stayed overnight in a hospital for drug/alcohol problem	18	1.4
Was given medication for psychological problem	111	8.6
Was unable to do responsibilities not because of illness	34	2.6
Was worried almost everyday for at least 6 months	69	5.4
Was afraid of going out/being in a crowd/car/over a bridge	70	5.4
Was so shy that could not go to party or speak/eat in front of others	27	2.1
Had a habit of checking/counting over and over	24	1.9
Had nagging thought such as unlocked door, etc.	73	5.7
Frequently heard voices or had visions that were not there	23	1.8
Believed things that are unusual/untrue	5	0.4
Had or thought to have drinking problems	33	2.6
Had or thought to have drug problems	42	3.3
Had ever been in jail/arrested/convicted	20	1.6
Had tried to kill oneself	31	2.4
Was so high that it interfered with functioning/others were worried	3	0.2
Was overactive that it interfered with functioning	5	0.4
Panic symptoms (both of the following 2 items)	60	4.7
sudden panic attacks without reason	99	7.7
sudden difficulty breathing	115	8.9
Depressive symptoms (2 of the 3 following items)	155	12.1
sad/blue for at least 2 weeks not because of illness/mourning	195	15.2
no energy not because of illness/mourning	141	11.0
sleep problems for most nights for at least 2 weeks	171	13.3
Any maternal psychopathology	367	28.56

Note. Numbers do not add up to 367 or 28.56% because of co-occurrence.

Multiple Logistic Regressions

Youth adjustment was regressed on maternal psychopathology and all predictors simultaneously. Good adjustment was predicted ($p < .05$) by absence of maternal psychopathology, lower level of adverse life events, higher IQ, closer parental monitoring, better family functioning, better physical health, higher educational aspiration, and larger number of other adults in the household (Table II).

Interaction Effects Between Maternal Psychopathology and the 11 Predictors

Based on the full sample, the interaction terms were tested individually while all other factors were controlled for simultaneously. The interaction between maternal psychopathology and gender approached significance ($p < .07$). The two genders fared equally well at low risk (approximately 66% of youth had a

Table II. Multiple Logistic Regressions of Good Adjustment in the Full Sample, and in the Two Subsamples of High-Risk and Low-Risk Youth, Four-Community MECA Study

	Full sample ($N = 1285$)[1]			High-risk youth ($N = 367$)[2]			Low-risk youth ($N = 918$)[3]		
Variable	Parameter estimate	Standard error	Adjusted odds ratio	Parameter estimate	Standard error	Adjusted odds ratio	Parameter estimate	Standard error	Adjusted odds ratio
Maternal psychopathology[a]	−.36*	.14	0.70	—	—	—	—	—	—
Paternal psychopathology[a]	−.26+	.15	0.77	−.45+	0.24	0.64	−0.16	0.20	0.85
Gender (female)[a]	.10	.12	1.11	0.53*	0.24	1.70	−0.05	0.15	0.95
Adverse life events[a]	−.48***	.12	0.62	−0.14	0.24	0.87	−0.63***	0.15	0.53
Living with two biological parents[a]	.24+	.13	1.27	0.43+	0.24	1.54	0.17	0.15	1.18
Higher SES[b]	.03	.07	1.04	0.05	0.14	1.05	0.04	0.08	1.04
Higher IQ[c]	.01***	.00	1.43	0.02***	0.01	2.07	0.01+	0.00	1.26
Closer parental monitoring[d]	.44**	.15	1.48	0.60*	0.26	1.71	0.38*	0.18	1.41
Better family functioning[d]	.17***	.03	2.01	0.17**	0.06	1.99	0.18***	0.04	2.07
Better physical health[d]	.23*	.11	1.31	0.30	0.20	1.41	0.21	0.13	1.27
Higher educational aspiration[e]	.35***	.08	2.03	0.27+	0.15	1.73	0.38***	0.09	2.14
Number of other adults in the family[f]	.18*	.07	1.20	0.27+	0.15	1.30	0.16+	0.08	1.17

[1]: Model: $N = 1285$; $\chi^2 = 181.93$; df = 12; $p = .0001$; [2]: Model: $N = 367$; $\chi^2 = 61.87$; df = 11; $p = .0001$; [3]: Model: $N = 918$; $\chi^2 = 108.01$; df = 11; $p = .0001$; + <.10; * <.05; ** <.01; *** <.001

[a] Dichotomized variable.

[b] AOR for one class difference on the Hollingshead scale.

[c] AOR between IQ = 85 and IQ = 115.

[d] AOR between 2 standard deviations (+1 versus −1 *SD*).

[e] AOR between finishing college and finishing high school.

[f] AOR for each additional other adult in the family.

good outcome for both genders), but girls appeared to do better than the boys at high-risk, with 62% of the girls had a good outcome and 50% of the boys had a good outcome. The interaction between maternal psychopathology and IQ was significant ($p < .05$). When at high risk, youth with a higher IQ adjusted better than those who had lower IQ, but IQ does not predict youth adjustment at low-risk. At low risk, approximately 87% of the youth had a good outcome regardless of their IQ. At high risk, youth with an IQ of 115 (1 SD above the mean) had an 85% chance to have a good outcome; youth with an IQ of 100 (at the mean) had an 80% chance to have a good outcome; and youth with an IQ of 85 (1 SD below the mean) had a 75% chance to have a good outcome.

Predictors of Youth Adjustment at Low-Risk Versus at High-Risk

In the high-risk subsample (Table II), resilience in youth (favorable outcome despite being at risk) was predicted by being a girl, having a higher IQ, being closely monitored by the parents, and living in better functioning families. In the low-risk subsample (Table II), good adjustment was predicted by lower levels of adverse life events, closer parental monitoring, better family functioning, and higher educational aspiration.

Generalizability of the Protective Factors Across Maternal Psychopathology and Adverse Life Events

Tiet et al. (1998) did not find an interaction between gender and adverse life events. They reported the interactions between adverse life events and IQ approached significance ($p < .07$), when the interaction terms were tested individually while all other factors were simultaneously controlled for, based on the full sample ($N = 1285$). We repeated their analysis (Tiet et al., 1998) with the inclusion of one additional factor, paternal psychopathology, in the equation and we found a similar result, in which the interaction of IQ and adverse life events approached significant level ($p < .08$).

Generalizability of the protective factors was examined by comparing pairs of full and compact models. Gender effect varied significantly ($\chi^2 = 4.25$; $df = 1$; $p < .05$) across the two risk factors (maternal psychopathology and adverse life events). The protective effect of IQ was not statistically different across the two risk factors.

DISCUSSION

Favorable adjustment among youth is associated with a number of resource factors: closer parental monitoring, better family functioning, higher educational

aspirations, absence of maternal psychopathology, lower levels of adverse life events, higher IQ, better physical health, and larger number of other adults in the family. An inverse relationship between parental monitoring and externalizing behaviors have been studied and discussed by many researchers (e.g., Dishion & McMahon, 1998); parental monitoring has also been associated negatively with other psychiatric disorders in children and adolescents. Previous studies have found the association between parental monitoring and lower levels of antisocial behavior (e.g., Patterson & Stouthamer-Loeber, 1984), substance use (e.g., Dishion & Loeber, 1985), internalizing problems (Barber, Olsen, & Shagle, 1994), and better school functioning (Brown, Mounts, Lamborn, & Steinberg, 1993). Likewise, family functioning has been reported to be associated with a number of psychological disorders or symptoms, including depression, suicidal behaviors (Keitner, & Miller, 1990), oppositional defiant disorder, conduct disorder (Frick et al., 1992), and conduct problems (Patterson, 1986). The current study showed that the inverse relationship between youth functioning and parental monitoring, as well as between youth functioning and family functioning, were independent of other factors, including maternal psychopathology and paternal psychopathology. The associations were consistent when analysis was based on the full sample, as well as when high-risk and low-risk subsamples were analyzed separately.

The current study found that higher educational aspiration was associated with better youth functioning. Rutter (1990) suggested that succeeding in an area that was identified as central to an individual would enhance the person's feelings about herself or himself, which in turn would lead to better functioning in other aspects. Tiet et al. (1998) showed that the association between higher educational aspiration and youth functioning was independent of, and beyond the effects of, academic achievement. It was suggested that educational aspiration might serve as a goal or motivator for some youth and provide them with a sense of meaning and purpose in their life (Tiet et al., 1998).

Having higher educational aspirations predicts better adjustment in the full sample but fails to predict resilience among the high-risk youth; on the other hand, gender does not predict adjustment in the full sample but it predicts resilience among high-risk youth. These results underscore the fact that some factors predict good adjustment in general, but not resilience (good adjustment among high-risk youth), or vice versa. Therefore, it is unwarranted to assume the effect of a predictor in the general population is identical to its effect in a specific high-risk group. For this reason, the design and development of secondary prevention programs need to rely on research of resilience, as well as on research on risk factors, in the general population.

This study shows that higher IQ protects youth whose mothers are psychologically disturbed. This finding is consistent with previous studies showing that higher IQ is a protective factor for children who are exposed to higher level of adverse life events (Garmezy et al., 1984, Masten et al., 1988; Tiet et al., 1998).

A possible explanation for this finding is that youth with higher IQ are better able to cope with adverse life events, such as integrating their experiences into their mental schemata, and therefore better able to ward off negative effects when at risk (Rutter, 1990; Tiet et al., 1998). Similarly, perhaps, youth with higher IQ may also be more able to find alternative solutions to problems they encounter when they have a psychologically disturbed mother.

The current study finds that girls are protected against maternal psychopathology, but not against adverse life events. Rutter (1987) suggested several explanations for the protective effect of being a girl. For example, parents are more likely to argue in front of boys than girls; boys are more likely than girls to react disruptively (rather than with emotional distress) which is, in turn, more likely to elicit a negative response from parents (Rutter, 1987). However, these explanations do not account for why being female is a protective factor against maternal psychopathology, but not against adverse life events. The following may be one of the possible explanations. Some research has suggested that mothers are more punitive with sons than with daughters (e.g., Dunn and Kendrick, 1982); other research has shown that parents with psychopathology tend to be more negative in their parenting than normal parents (e.g., Hamilton, Jones, & Hammen, 1993). Consequently, mothers might be more punitive and negative toward boys when they are psychologically troubled, and psychopathology in the mothers may therefore be less deleterious to the girls than the boys. On the other hand, the finding is somewhat counter-intuitive in the sense that a greater effect in the mother/daughter dyad is also expected; therefore, the gender effect merits further exploration.

Findings on gender effects are inconsistent. Some studies have found female gender to be a resource or a protective factor (Earls, 1987; Eme, 1979; Rutter, 1990), and several studies have reported insignificant findings of gender effect on youth adjustment (e.g., Luthar, 1991; Tiet et al., 1998). Werner & Smith (1982) found that being female was a resource factor from birth to 10 years, but that the trend reversed during the second decade, when problems in boys decreased and behavior problems in girls increased. Still other studies have found that gender effect varies, dependent upon how the outcome measure is defined (Garmezy et al., 1984; Masten et al., 1988; Luthar et al., 1993). Interestingly, the current study finds that the protective effects of being a girl differ across risk factors, even when the outcome measure is identically defined. There might be several reasons why the impact of gender seems to vary across studies, or within a single study. First, the impact of gender varies across outcome measures for those outcomes that are gender related, such as depression or conduct disorder. However, this difference in the definition of the outcome does not account for all of the discrepancies. In the current study, for example, the outcome measure in all the analyses is identical. Alternatively, the measure of gender may be related to a number of associated constructs that vary in their own way, for instance differences in socialization in one

study and hormonal level differences in another. Therefore, the effects of gender across studies might not reflect the same underlying constructs. The discrepancies across studies warrant the construction and examination of specific hypotheses of what constitutes gender effects. In other words, the processes through which the protective effects of gender act need to be better specified and tested.

The protective effect of being a girl is specific to maternal psychopathology, whereas the protective effect of higher IQ is generalizable across the two risk factors examined. These findings accentuate the relevance of the specificity or generalizability of protective factors. Besides the conceptual and theoretical significance, examination of the specificity/generalizability of a protective factor also has practical and methodological implications. Protective factors that are more generalizable are also more practical and desirable in preventive interventions, all other factors being equal, such as feasibility or economical constraints. Methodologically, examining the specificity/generalizability of a protective factor is one way to generate hypotheses concerning the processes through which the protective factor acts. For example, one possible hypothesis of the protective effect of being a girl is that girls tend to receive more social support. This hypothesis can be tested by examining the level of social supports received by boys and girls at both high and low levels of both risk factors.

In summary, high-risk youth seemed to be resilient in the face of maternal psychopathology if they received more guidance and supervision by their parents, or lived in a better functioning family. Youth with higher IQ do not differ from lower IQ youth at low risk, but youth with higher IQ may be more capable of coping with their mothers' psychopathology. Similarly, although there were no gender differences at low risk, girls are more resilient than boys when their mothers are psychologically ill. Being a girl is a protective factor against maternal psychopathology but not against adverse life events, whereas higher IQ is a protective factor against both maternal psychopathology and adverse life events.

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